

# Petcoke-Coal Test Results

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January 13, 2014



ENVIRONMENTAL HEALTH  
& ENGINEERING, INC.

# Findings

- No evidence of petcoke or coal on surfaces or in soil of East Side and South Deering neighborhoods based on indicators identified by testing petcoke and coal\*
- Supporting Information
  - Composition of soil in East Side and South Deering neighborhoods similar to control neighborhoods, and was not different in any statistically significant way from levels in soil in the City of Chicago as reported by the U.S. Geological Survey or from background levels reported by the State of Illinois Environmental Protection Agency Tiered Approach for Corrective Action (TACO) program
  - Signature heavy metals and PAHs for petcoke and coal not found on surfaces sampled

\* This presentation focuses on two key indicators of petcoke and coal: the vanadium to nickel ratio, and polynuclear aromatic hydrocarbon (PAH) ratios. Other indicators include vanadium, naphthalene, 1-methylnaphthalene, 2-methylnaphthalene, 1-chloronaphthalene, benzo(a)pyrene, benzo(g,h,i)perylene, dibenz(a,h)anthracene; proximity to petcoke/coal terminals; and markers of transportation-related impacts (*e.g.*, lead, proximity to roads, railroads, and asphalt)

# Polynuclear Aromatic Hydrocarbon Profiles



GREATER CHICAGO AREA



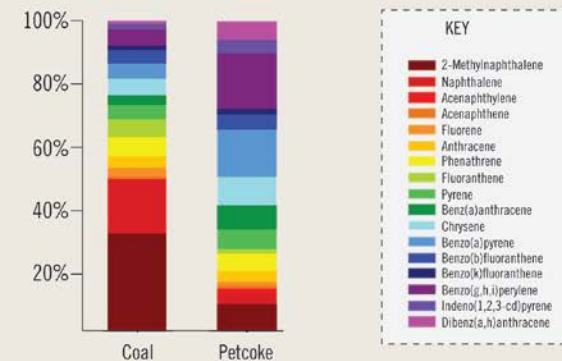
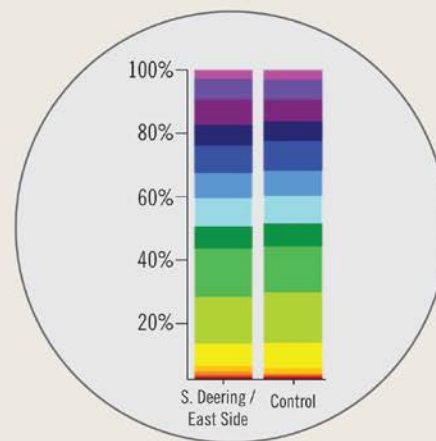
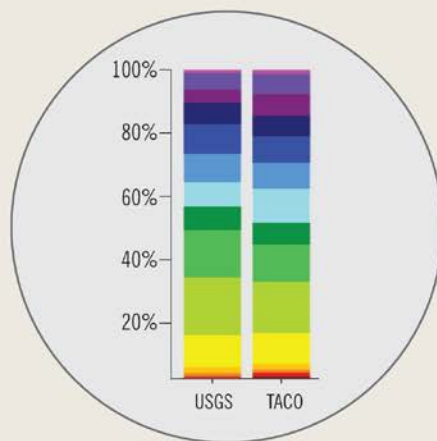
SAMPLED NEIGHBORHOODS - ABUTTING COAL SITES AND CONTROLS

## WHAT ARE POLYNUCLEAR AROMATIC HYDROCARBONS?

Polynuclear aromatic hydrocarbons are a group of chemicals that occur naturally in coal and crude oil. Forest fires and volcanoes produce PAHs naturally as well.

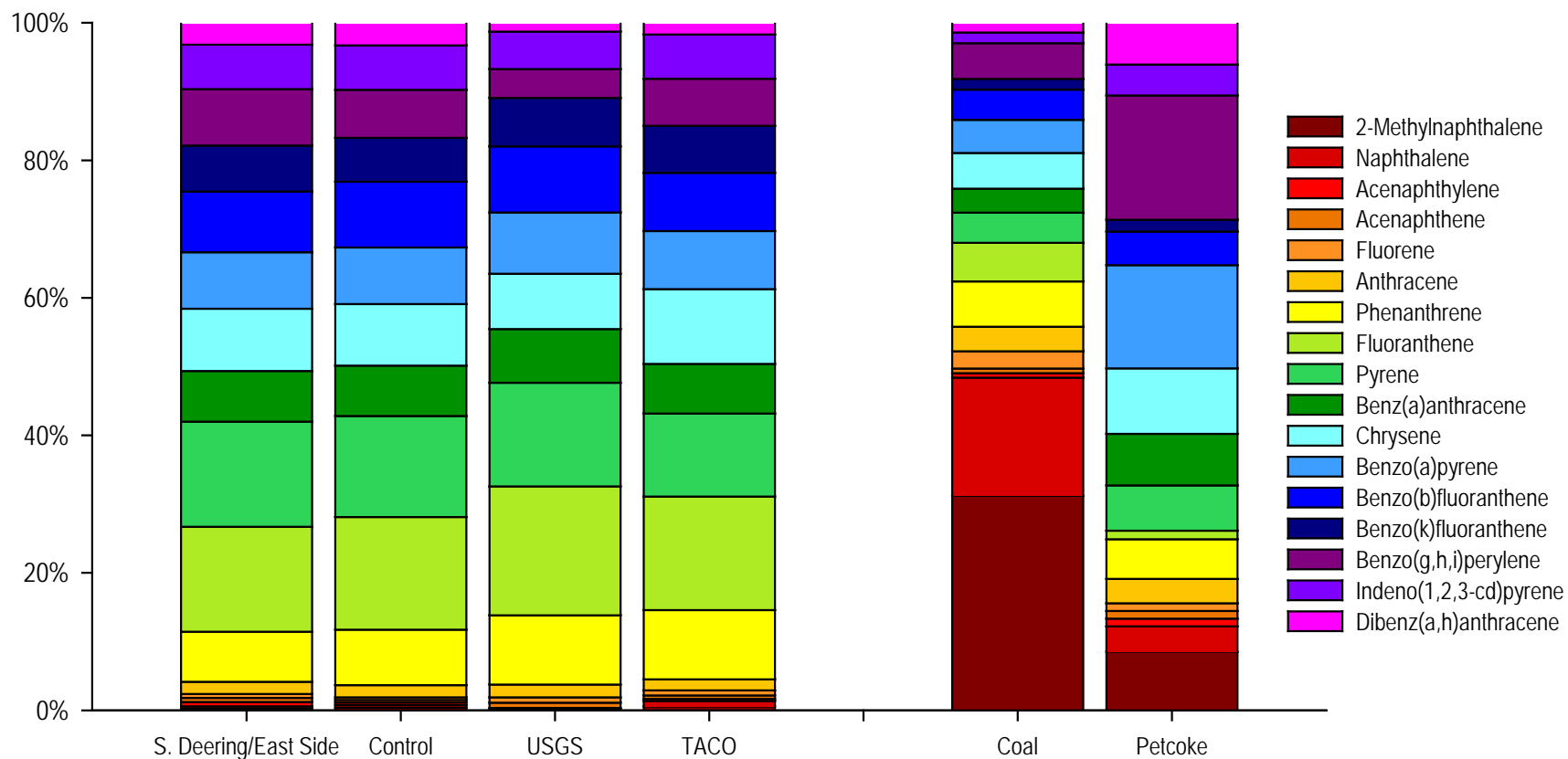
PAHs also are present in products made from fossil fuels, such as home heating oil, kerosene, gasoline, diesel fuel, and asphalt. PAHs are released into air and made whenever fossil fuels, petroleum products, wood, garbage, and other organic substances are burned. PAHs are widespread in soil, air, and water throughout the United States and the world.

Source: adapted from the Illinois Department of Public Health



Soil of South Deering and East Side neighborhoods is similar to the rest of Chicago, and different from coal and petcoke.

# PAH Profiles



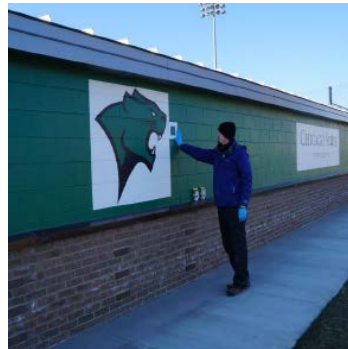
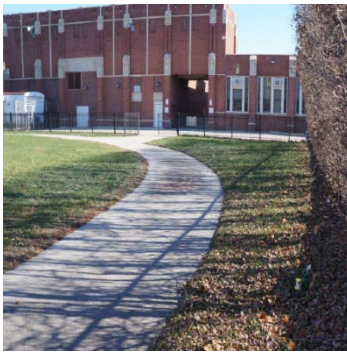
# Study Outline

- Conducted an investigation with the objective of examining surfaces and soil in the East Side and South Deering neighborhoods for the presence of petcoke and coal.
- Examined the soil and surfaces for chemical indicators (signatures) of petcoke and coal, including certain metal (vanadium to nickel) and polynuclear aromatic hydrocarbon (PAHs) ratios.
- Samples were collected and tested in accordance with ASTM and EPA methods by independent environmental professionals and laboratories.
- Collected 69 samples of soil and surface dust in late November-early December 2013 from the East Side and South Deering neighborhoods and control areas.
  - Publicly accessible locations: parks and rights of way
  - Many locations near the petcoke/coal terminals
  - Benches, bleachers, bus stop shelters, sides of storage buildings, and green space
  - Selected to be representative of homes, buildings and yards on private property

# Snapshot of Sampling Locations

	A	B	C	D	E	F
1	ID	Location Type	Location Description	Surface Type	Description	Area
2	110	Bus Stop	Michigan & 115th Street	Metal	Bus sign pole	Control
3	60	Intersection	107th Street & S. Hoxie Street	Metal	Stop sign	S. Deering / East Side
4	20	Park	Camulet Park	Metal	Vertical bar	S. Deering / East Side
5	85	Park	Rowan Park	Painted wood	Bench	S. Deering / East Side
6	107	Park	Langston Hughes Elementary	Metal	Bench	Control
7	55	Bus Stop	3033 E 106th Street	Metal	Bent bus sign	S. Deering / East Side
8	98	Bus Stop	Ewing & 102nd Street	Metal	Bus sign	S. Deering / East Side
9	76	Bus Stop	Avenue C & 109th Street	Metal	Bus stop	S. Deering / East Side
10	102	Park	Burnside Park	Painted wood	Bench	Control
11	37	Park	Trumbull Park	Painted wood	Bench	S. Deering / East Side
12	109	Park	Morgan Field Park	Painted wood	Fountain	Control
13	86	Park	Off of E 126th St	Painted wood	Bench	S. Deering / East Side
14	95	Park	Lion Field	Painted Concrete	Building	Control
15	82	Bus Stop	Avenue O & 114th Street	Glass	Bus shelter	S. Deering / East Side
16	88	Bus Stop	103rd Street CTA Terminal	Plastic	Glass wall panel	S. Deering / East Side
17	43	Bus Stop	Ewing & 103rd St	Metal	Bus sign	S. Deering / East Side
18	87	Park	Harborside International Golf Center	Metal	Guardrail	S. Deering / East Side
19	53	Bus Stop	2801 E 106th Street	Metal	Bus stop sign	S. Deering / East Side
20	57	Park	Krause Park	Concrete	Barrier	S. Deering / East Side
21	29	Bus Stop	Yates & 102nd Street	Metal	Bus sign	S. Deering / East Side
22	32	Bus Stop	Commercial & 102nd St	Metal	Bus sign	S. Deering / East Side
23	6	Park	Veteran's Memorial Park	Painted wood	Bench	S. Deering / East Side
24	12	Bus Stop	Yates & 99th St	Metal	Bus sign	S. Deering / East Side
25	84	Park	Eggers Woods	Wood	Table	S. Deering / East Side
26	21	Park	Luella Park	Painted wood	Bench	S. Deering / East Side
27	100	Bus Stop	Commercial & 104th Street	Metal	Bus sign	S. Deering / East Side
28	46	Bus Stop	2700 E 104th Street	Metal	Bus sign	S. Deering / East Side







# Technical Review

- All sampling and testing designed by David L. MacIntosh, Sc.D, C.I.H, Chief Science Officer with Environmental Health & Engineering, Inc.
  - Adjunct Associate Professor at the Harvard School of Public Health
  - Technical advisor to government agencies and the World Health Organization
  - 20 years experience as an active member of the environmental health profession
  - Author of numerous publications in the area of exposure assessment, risk analysis, and environmental management
- Test results interpreted and analyzed by Dr. MacIntosh



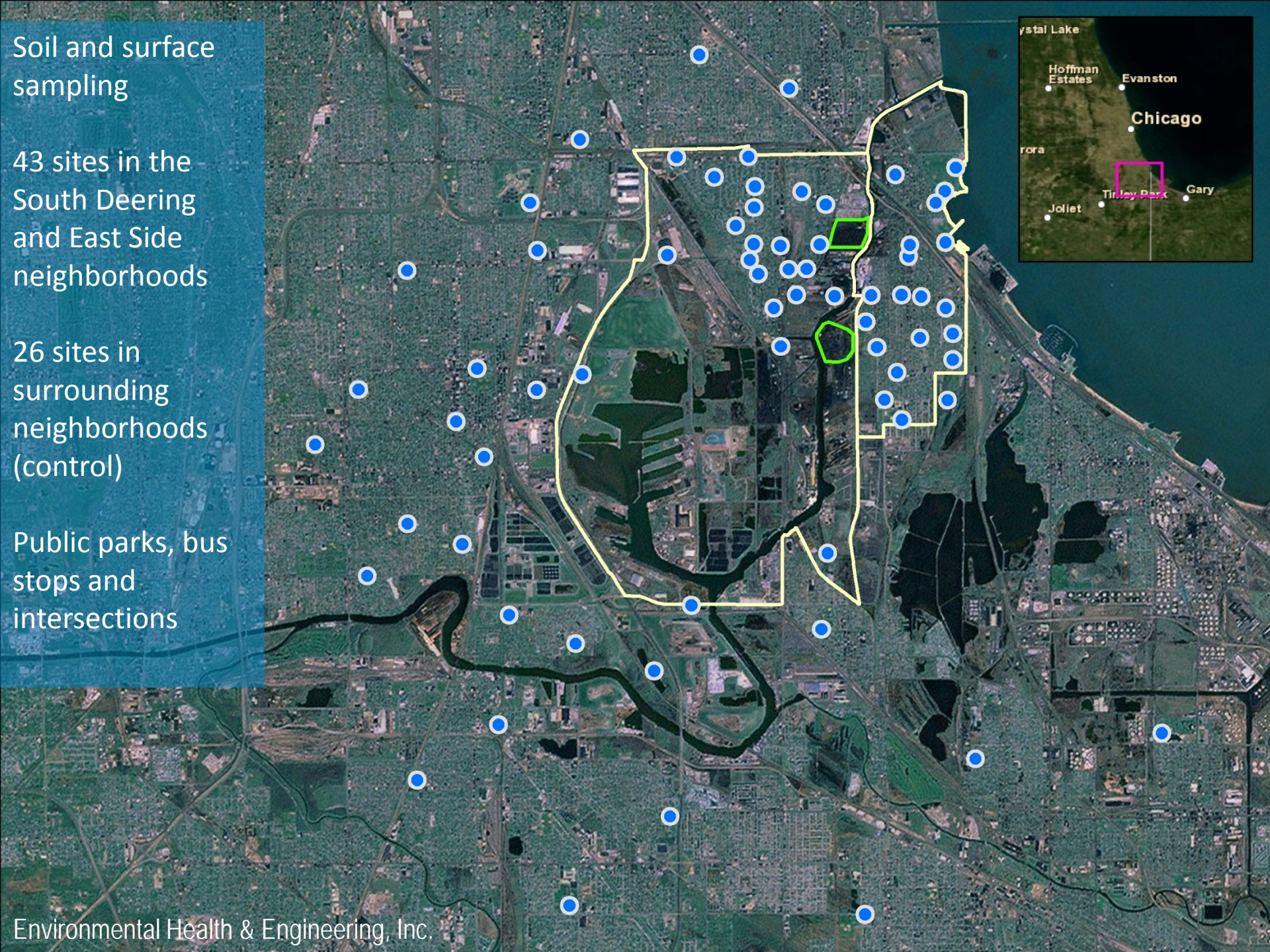
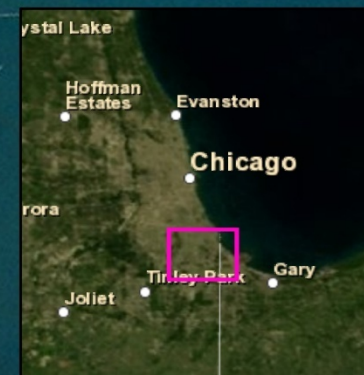
Soil and surface  
sampling

43 sites in the  
South Deering  
and East Side  
neighborhoods

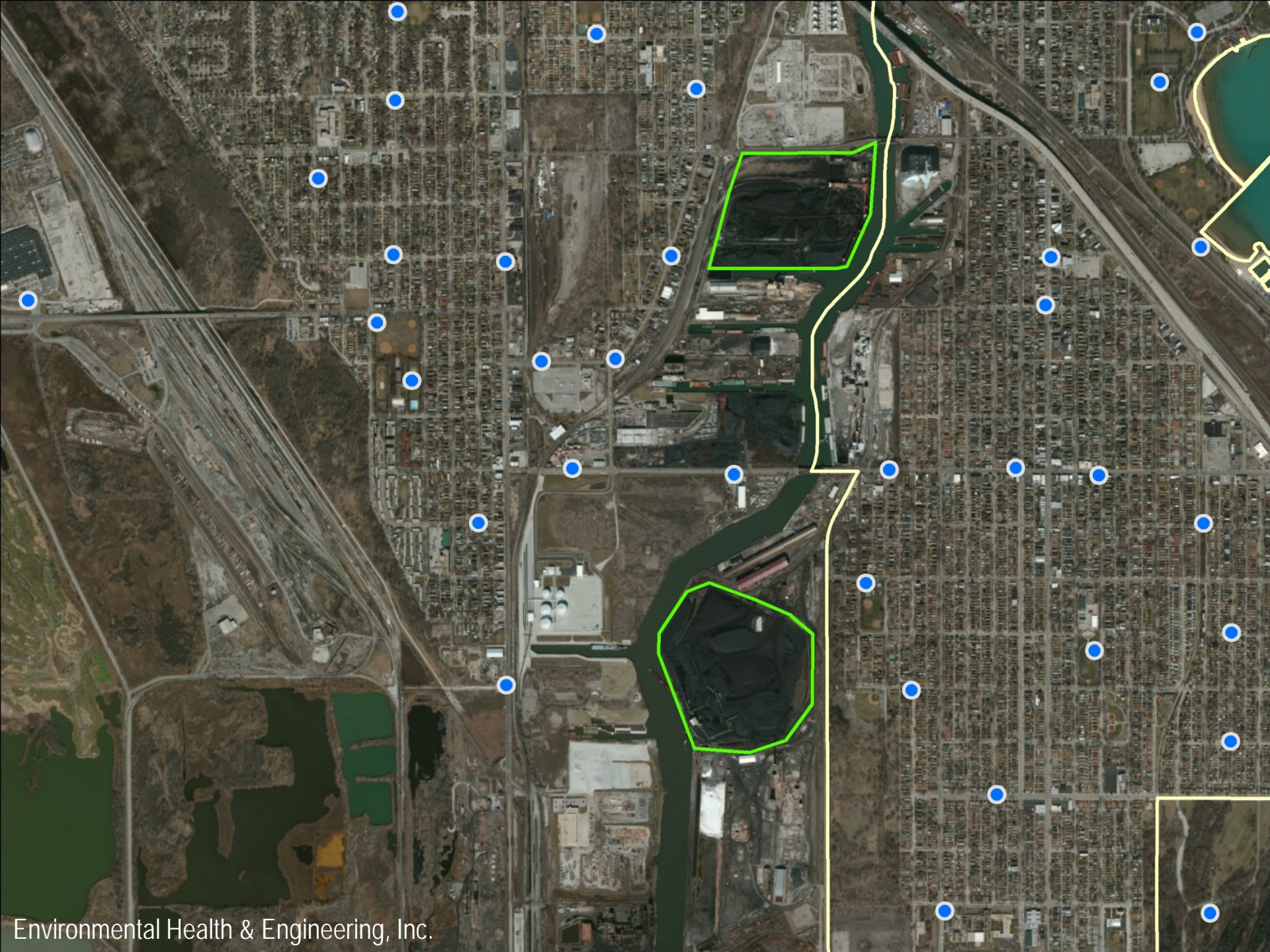
26 sites in  
surrounding  
neighborhoods  
(control)

Public parks, bus  
stops and  
intersections

Environmental Health & Engineering, Inc.









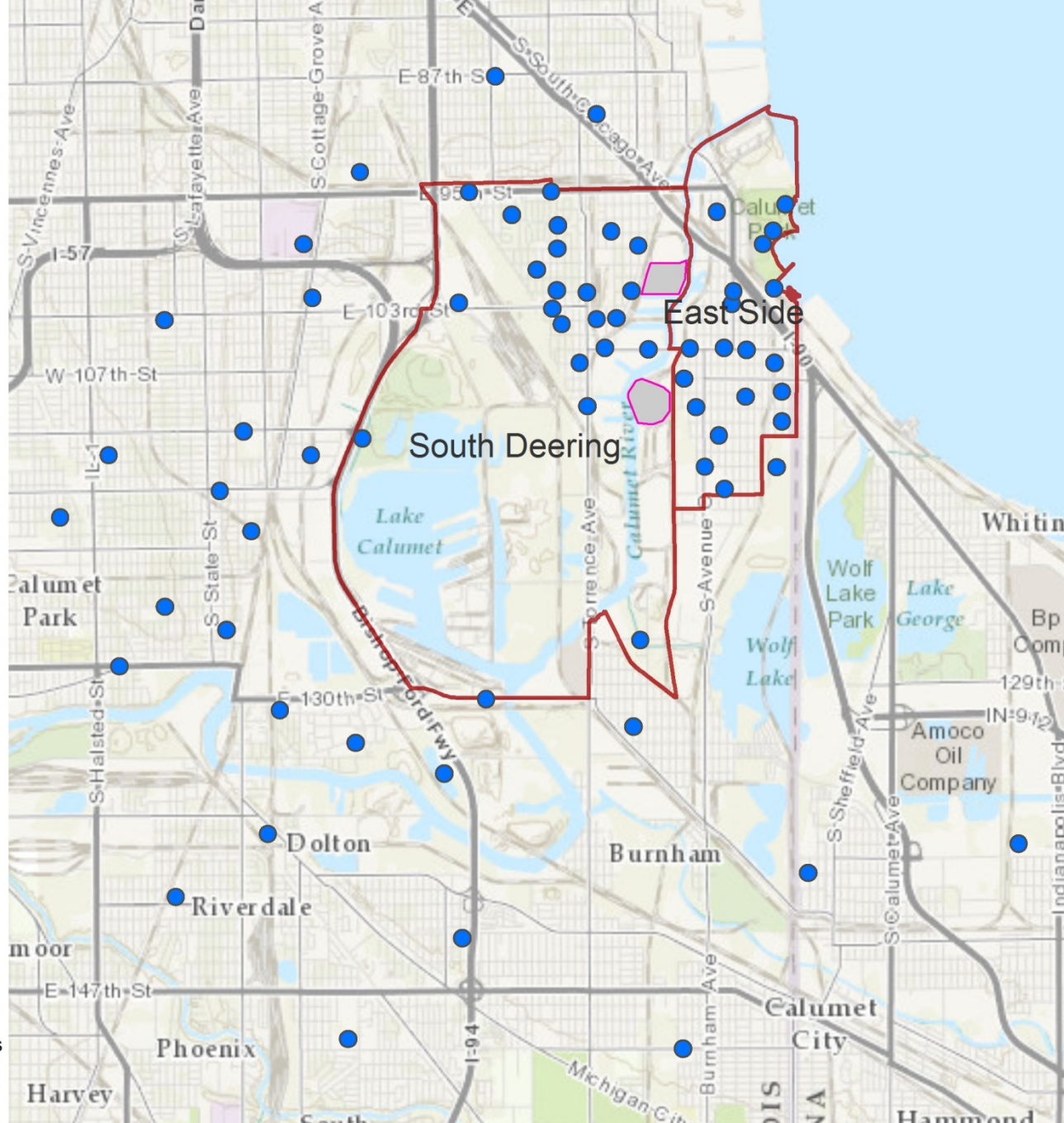
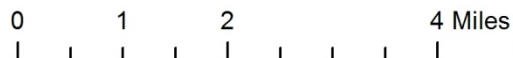
## Sampling Locations

- Sampling Locations
- Site Locations
- ▭ Neighborhood Boundaries

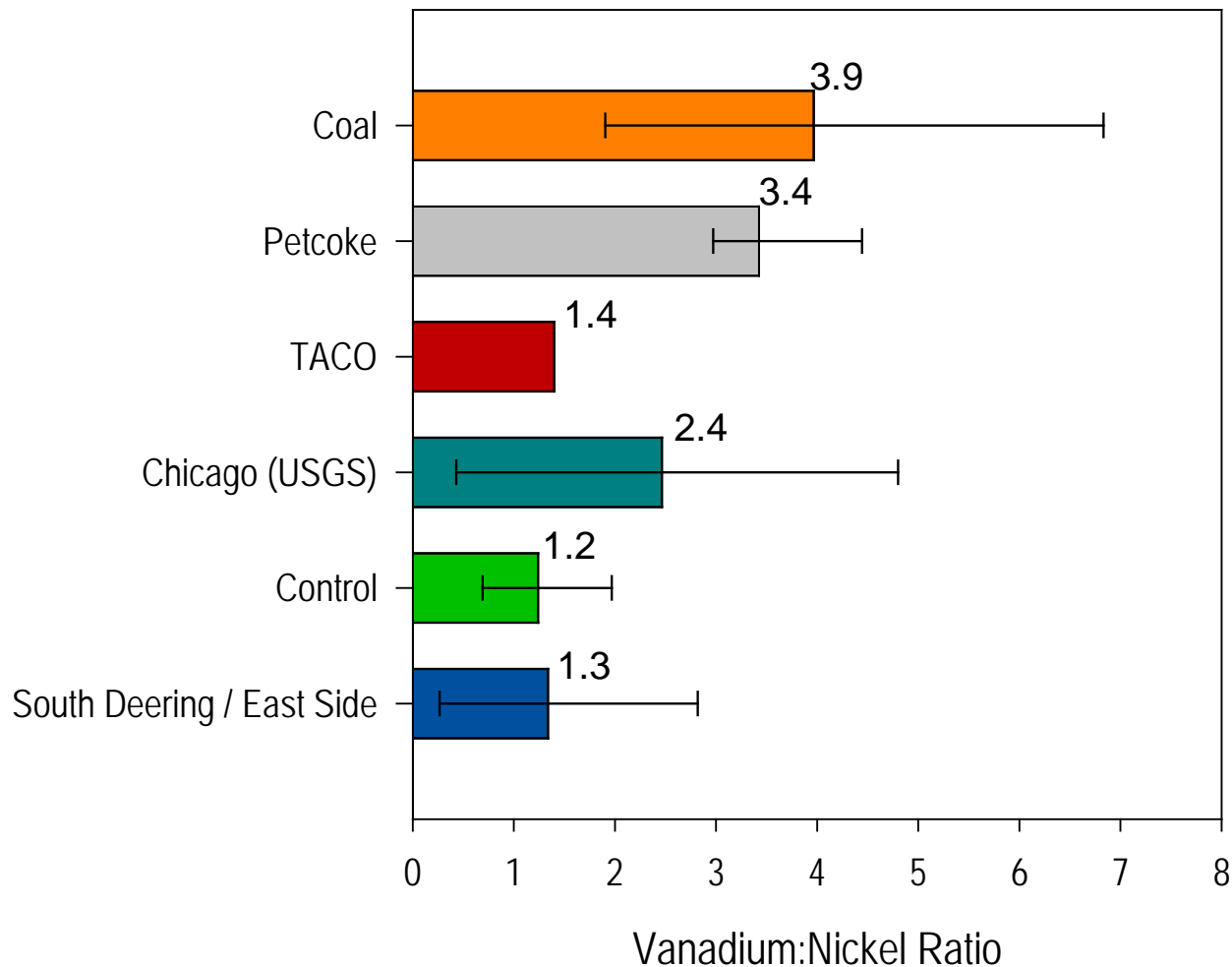
Soil and surface sampling

69 total sites, 26 sites in control area

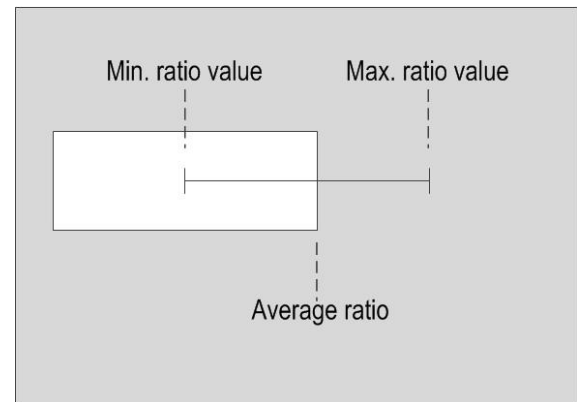
Public parks, bus stops and intersections



# Signature Metal Ratios



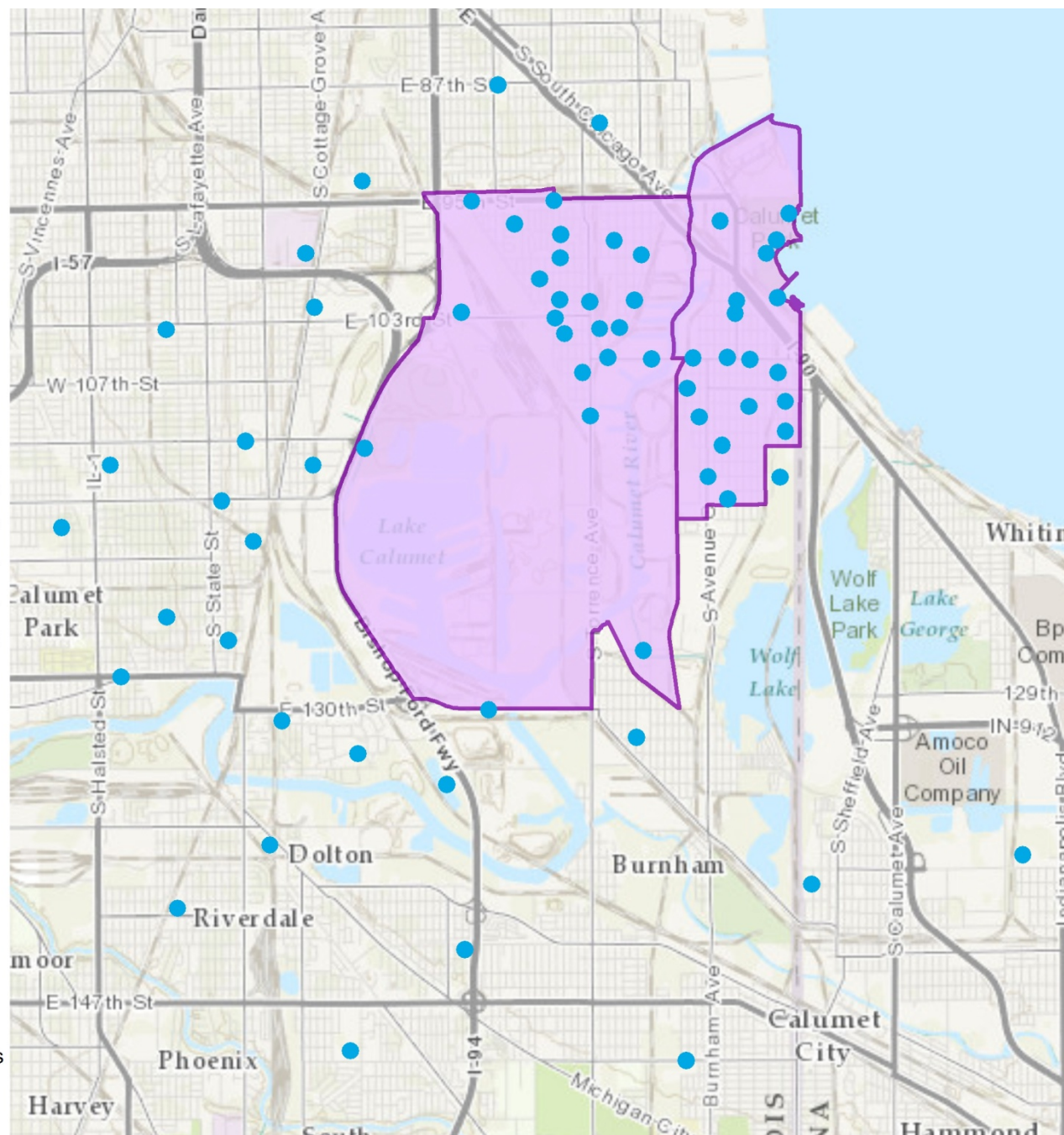
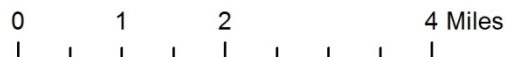
## Key





- Sampling Locations
- S. Deering / East Side

Mean V:Ni Ratio	
S. Deering/East Side	1.3
Control	1.2
Chicago (USGS)	2.4
TACO	1.4
Petcoke	3.4
Coal	3.9



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